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How Will Europe's Unified Standards Affect U.S. Building Products?

It seems likely that the nations of the European Community will set the de facto product testing standards for the rest of the world.

More and more Americans are realizing that December **31, 1992,** will be a landmark date in European history. By then, the European Community (EC) countries will have taken steps to harmonize a number of issues that relate to trading, the foremost being product test standards. This will not affect the United States directly; indirectly, however, the effects will be exceedingly important.

Until now, the United States has been the dominant technological power of the modern era. **As** a result, technical standards established in the United States for various products have been foremost internationally. The **12** EC countries, however, have a total population larger than that of the United States.

Furthermore, the European Economic Area was formed recently, and standards mandated for the EC also will be used by the seven European countries that belong to the European Free Trade Association (EFI'A) group. Together, EC and EFI'A countries have a population of 380 million, which is about **50** percent larger than that of the United States. And the European countries are equally advanced technologically.

Therefore, there is every expectation that the worlds future de facto product testing standards will be established under the auspices of the EC. U.S. standards-making bodies and U.S. manufacturers need to be aware of the probable direction of these standards. Only by moving U.S. standards and U.S. products' performance in the direction of these new norms will this nation's manufacturing concerns be able to continue successful export activities.

This article addresses aspects of harmonization that relate to the fire performance of building products.

The unified Europe

In **1985,** the Commission of the European Community set forth a program for completing the internal market among EC member states by the end of **1992.'** The EC Council of Ministers formalized the program in **1986** as the Single European Act. The term "completing the internal market" refers to activities associated with the elimination of trade barriers that exist among the member states. This will include activities such as a complete overhaul of customs procedures at borders between the countries.

Free trade is meaningful only if freely imported products can be used legally for their intended purpose. This would not be the case if test standards or required health and safety measures differed from one country to the next. (Test standards unrelated to health and safety are generally not an issue, since they do not represent mandatory government actions.)

To harmonize its standards, the EC has issued a number of directives pertaining to different areas of commerce. Of relevance to fire safety is the Construction Products Directive.[2] This provides some very general essential requirements, such **as** the following:

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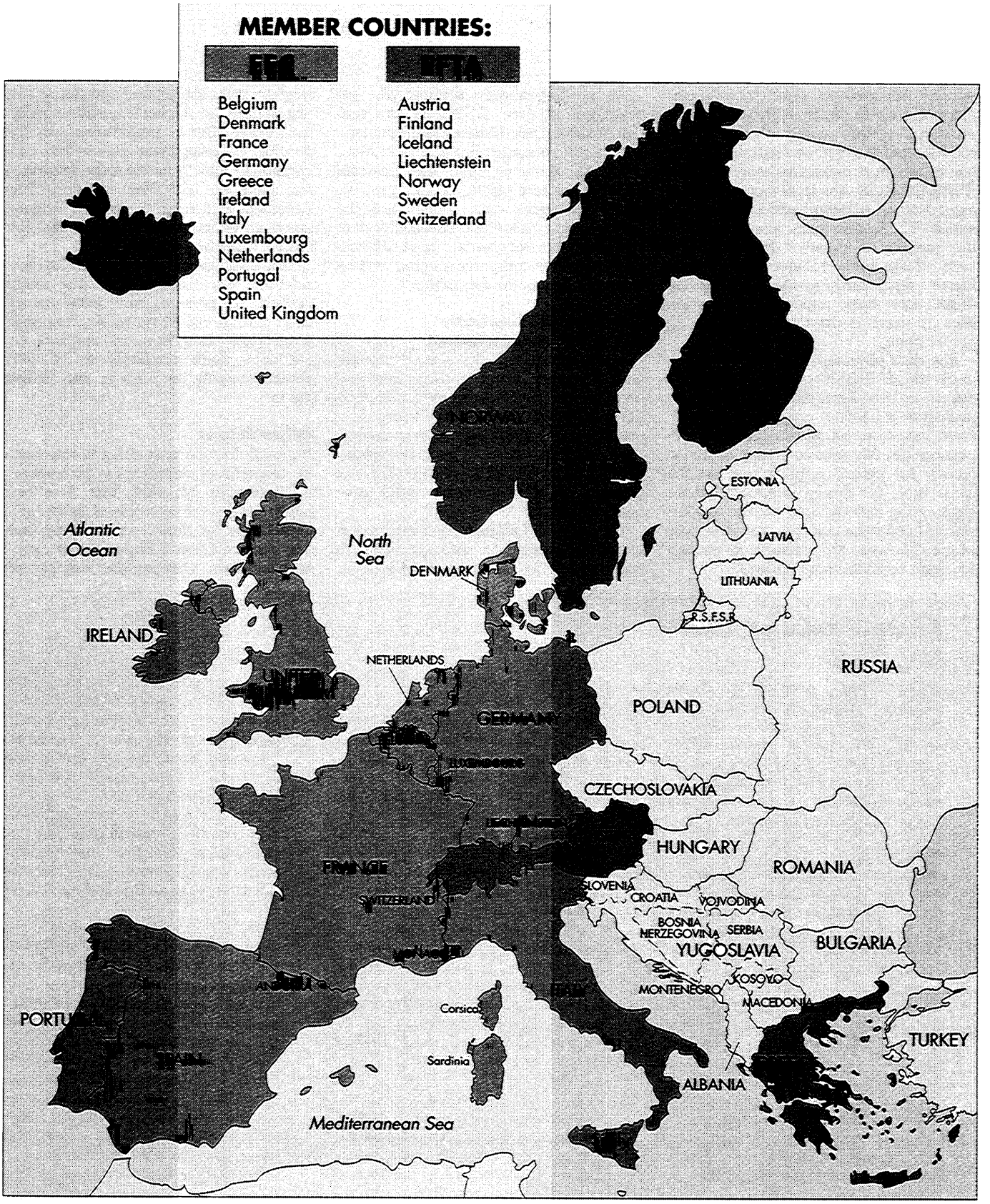

also the design of sprinkler systems, fire alarms, and other active fire safety measures.

Results of EUREFIC research

The results of the EUREFIC research program were presented in a seminar in Copenhagen on September 11 and 12, 1991. In conjunction with the seminar, a book of proceedings summarizing the findings in each study area was issued.[1] The benchmark test used for wall and ceiling linings in the EUREFIC proposal is the ISO 9705 room/corner test. Since this is a full-scale fire test using a plausible fire scenario that is internationally agreed upon by experts, it is intrinsically valid. The most important variable is time to flashover, for products where flashover occurs. Other quantitative variables include the heat release rate and the production of smoke.

For most products, full-scale testing will be unnecessary and bench-scale tests using the cone calorimeter can be used. Certain classes of products—those showing a propensity to collapse prior to

Class 1 or Class 2 for the same application. Such safety level issues are not considered to be barriers to trade. In the long run, however, pressures may develop that will bring national philosophies closer on safety level issues.

In related fire safety areas, the EC issued a proposal in March 1990 for a draft council directive on the fire behavior of upholstered furniture, related articles, and constituent products." This work was started much later than the harmonization of fire safety tests on building products; however, its progress could be more rapid since the directive is more explicit and less dependent on an interpretative document. This directive lists three essential provisions:

1. Resistance to ignition from cigarettes and small flaming sources. This specifies a series of requirements on what furniture intended for various occupancies must comply with;

2. If, despite the provision of a certain amount of resistance to ignition, furniture is ignited, the room must remain tenable for a certain period of time, which differs according to whether the furniture item is for use in residences or in public occupancies;

3. In public occupancies, special provisions are to be made against progressive fire spread. Such spread can occur, for instance, when several identical chairs are located next to, or on top of, each other. Chairs that show limited burning when ignited alone may show unacceptable behavior in this type of scenario.

The provisions of the directive have been controversial in the EC countries, where the existing degrees of control over upholstered furniture flammability vary widely. A working group in CEN/TC 207 currently is attempting to formulate the needed tests in this area, along with a classification system.

applied to the sample. What level should this be? Should it be different for carpeting materials than for ceiling materials? Their potential for exposure to fire are different; therefore, should the test be modified for the product? And should the resulting data be used differently? The answers to such questions are not simple. They must be well thought out, along with the regulatory scheme in which the results will be used.

Many manufacturers point to additional costs. If U.S. codes and standards were to change, U.S. manufacturers who do not sell overseas must retest their products to meet the new codes, or must be grandfathered. The latter solution poses potential enforcement problems in the field by the authority having jurisdiction. Testing organizations will incur additional costs for equipment, accreditation fees, and so forth.

While it may appear that I am playing the devil's advocate and that U.S. codes and standards will never be updated, I agree with Dr. Babrauskas that newer tests, such as the cone calorimeter, the full-scale room tests coupled with rate-of-heat-release measurements, better engineering data, and computer modeling, will be the necessary tools for the present and the future of the fire community.

Action needed

In most practical respects, the EC and the EFTA countries will become a unified-standards market after 1992. It therefore seems probable that these European countries will set the de facto world standards, and that U.S. manufacturers may be at an increasing disadvantage in selling their products abroad and in importing needed materials.

Three actions that are needed as soon as possible include research, the adoption of the pertinent standards, and a revision of building codes. Research is needed to determine how to make changes with the least disruption to industry, while at the same time ensuring the complete adequacy of fire safety levels. U.S. standards organizations must coordinate their documents with the pertinent ISO standards. Only one U.S. standard, the cone calorimeter, now exists that is directly equivalent to the pertinent ISO standard. No U.S. equivalent to ISO 9705 has been adopted, and the U.S. drafts published to date differ in crucial technical aspects from the ISO standard. U.S. standards in the area of fire endurance are similar in testing philosophy to ISO standards, but there are significant technical differences in several areas. U.S. equivalents to all of these ISO standards will need to be adopted.

The final step is the revision of U.S. building codes. New test standards by themselves do not complete the needed changes in the qualification of products. To have an effect on the marketplace, the standards must be written into the U.S. building codes. This will require a certain amount of research to determine the exact details by which this can best be implemented.

Finally, it must be emphasized that, in addition to facilitating trade and economic competitiveness, such a change will result in levels of safety actually being raised in some cases. For example, the method that U.S. and Canadian building codes specify for testing wall/ceiling linings—the E84 Steiner Tunnel—dates back to the technology of the early 1940s. By contrast, methods developed out of the EUREFIC research program build upon modern fire engineering principles and represent fire effects more realistically.

1. "Completing the Internal Market," White Paper from the Commission to the European Council, COM(85) 310 final, Brussels, 1985.

2. Council Directive of 21 December 1988 on the approximation of laws, regulations, and administrative provisions of the member states relating to construction products (89/106/EEC). Published in *Official Journal of the European Communities*, No. L 40, pp. 12-26, February 11, 1989.

3. Both the EC and the EFTA groups of countries belong to CEN, excluding only those countries without a national standards body. Those standards adopted by CEN that are cited in EC directives must be adopted by the national standards bodies of the member countries, and all contradicting national standards must be withdrawn.

4. Blachère, G., Tephany, H., Trottein, Y., and Martin, J., "Fire Reaction Tests in the EEC—Can a material be accepted in a member state on the basis of the results of tests performed in another member state?" (Report DG III/B/5 Ref. III/3197/88-EN). Commission of the European Communities, Brussels, 1988.

5. Commission working paper on the work programme for CEN/TC 127(III/B/5). Commission of the European Communities, Brussels, April 25, 1988.

6. Babrauskas, V., "Development of the Cone Calorimeter—A Bench Scale Heat Release Rate Apparatus Based on Oxygen Consumption," *Fire and Materials 8*, 81-95, 1984.

7. Proposed Standard Method for Room Fire Test of Wall and Ceiling Materials and Assemblies, *1982 Annual Book of ASTM Standards*, Part 18. American Society for Testing and Materials, Philadelphia 1982.

8. Council Directive 89/106/EEC—Construction Products–Essential Requirement—Safety in Case of Fie—Note to the Technical Committee (III/3534/90-EN), Document TC2/002, Commission of the European Communities, Brussels, January 26, 1990.

9. Council Directive 89/106/EEC on the approximation of laws, regulations and administrative provisions of the member states relating to construction products. Interpretative Document—Essential Requirement—Safety in Case of Fire (Document TC2/021). Commission of the European Communities, Brussels, September 1991.

10. *Proceedings of EUREFIC Seminar*, Inter-Science Communications Ltd., London, 1991. In the United States this volume can be purchased from Technomic Publishing, 851 New Holland Avenue, Lancaster, PA 17604.

11. Program CT available from: SINTEF, NBL, Trondheim N-7034, Norway.

12. Draft council directive on the approximation of the laws, regulations, and administrative provisions of the member states relating to the fire behavior of upholstered furniture, related articles, and constituent products, Brussels, 12 March 1990; revised 8 February 1991.

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